



Declaration

I, the undersigned, Tomohiro Inoue, is one of the common inventors of PCT/JP2003/095553(U.S.Serial No.10/522707) and PCT/JP2002/05027(U.S.Serial No.10/476947) and developed proton conductor gas sensors in the assignee with Mr. Hideki Okoshi, presently working for Tokuyama Corporation. The development group comprised at first I, Mr. Okoshi and Mr. Takeshi Nakahara, and later, Mr. Kaneyasu was involved in place of Mr. Nakahara.

JP2001-157167, whose priority was claimed in PCT/JP2002/05027, described only the embodiment in Figs.1-10 and did not describe the best embodiment of PCT/JP2002/05027. In the best embodiment, a small hole having an accurate diameter of 0.1mm is made in a thin metal Ti plate as the gas diffusion hole. Our proton conductor gas sensors have an output current proportional to the amount of gas supplied through the gas diffusion hole, and the uniform gas diffusion hole is necessary for making the sensor outputs uniform between sensors. Before inventing the gas diffusion holes made by punch in the metal plates, we made diffusion holes of 0.1-0.3mm in diameter by etching stainless steel plates. We found the variations in size of gas diffusion holes because of over-etching and under-etching made sensor outputs not uniform around December, 2001; it was after Mr. Nakahara left our team.

April, 13, 2007

Tomohiro Inoue
Tomohiro Inoue



Declaration

I, the undersigned, Kazunari Kaneyasu, is one of the common inventors of PCT/JP2003/09553(U.S.Serial No.10/522707) and PCT/JP2002/05027(U.S.Serial No.10/476947). I became involved in the development of proton conductor gas sensors with Mr.Tomohiro Inoue and Mr.Hideki Okoshi, from around October, 2001 in place of Mr.Nakahara. One of our results is the gas diffusion hole having an accurate diameter in a thin Ti plate made with a punch. Controlling uniformly the size of the gas diffusion hole makes the variation in the sensor output smaller.

While I am listed as one of the inventors of PCT/JP2002/05027, I was only involved in the development of the best embodiment shown in Figs.11-25 and so on, and I was not involved in the invention in JP2001-157167 application, the priority of which was claimed in PCT/JP2002/05027 and corresponds to the embodiment in Figs.1-10 in PCT/JP2002/05027.

April, 13, 2007

Kazunari Kaneyasu

Kazunari Kaneyasu



Declaration

I, the undersigned, Hideki Okoshi, is one of the inventors of PCT/JP2002/05027(U.S.Serial No.10/476947) and is presently working for Tokuyama Corporation. I developed with Mr. Tomohiro Inoue, Mr. Takeshi Nakahara, and Mr. Kazunari Kaneyasu proton conductor gas sensors in Figaro Engineering Inc. Our development team was initially made of I, Mr. Inoue, and Mr. Nakahara and then Mr. Kaneyasu joined in place of Mr. Nakahara.

JP2001-157167, whose priority was claimed in PCT/JP2002/05027, described only the embodiment in Figs.1-10 and did not describe the best embodiment and its versions in PCT/JP2002/05027. We developed the best embodiment with Mr. Kaneyasu in stead of Mr. Nakahara. When we developed the JP2001-157167 gas sensors, we were considering the basic design of proton conductor gas sensors and we introduced ambient gases into the detection electrodes through small holes in metal plates and filter caps having active charcoal. We found that the uneven size of the holes made the sensor outputs not uniform after Mr. Kaneyasu joined us.

April, 13, 2007

A handwritten signature in cursive script, reading "Hideki Okoshi", written over a horizontal line.

Hideki Okoshi



Declaration

I, the undersigned, Takeshi Nakahara, is one of the inventors of PCT/JP2002/05027(U.S.Serial No.10/476947). I was involved around September, 2000 in the development of proton conductor gas sensors with Mr.Tomohiro Inoue and Mr.Hideki Okoshi in Figaro Engineering Inc., the assignee of the above application. One of our results is the invention claimed in PCT/JP2002/05027. According to PCT/JP2002/05027, a proton conductor membrane and detection and counter electrodes are positioned between a pair of metal plates, and they are wrapped within thermo-plastic films. Thermal shrinkage of the films secures good contact between the membrane, electrodes, and metal plates.

When we developed the technology initially, the best embodiment of Figs.11-26 in PCT/JP2002/05027 was yet to be developed; the Japanese application, JP2001-157167, the basis of priority claimed in PCT/JP2002/05027, described only the embodiment shown in Figs.1-10. Further, the inventors of JP2001-157167 were I, Mr. Inoue and Mr. Okoshi; Mr. Kaneyasu was not one of the original inventors. I left the development of proton conductor gas sensors around October,2001, and, in place of me, Mr. Kaneyasu joined the development team.

After the application of JP2001-157167, Figaro decided to make a PCT application for the invention. The best embodiment shown in Figs.11-25, et al. were introduced into the description, and Mr. Kaneyasu was listed as another inventor, since he contributed to the development of the best embodiment. I was not involved in the development of the best embodiment. Now, I am the president of Figaro Engineering Inc.

April, 13 ,2007

A handwritten signature in cursive script that reads "Takeshi Nakahara".

Takeshi Nakahara